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Appendix B

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Handbook
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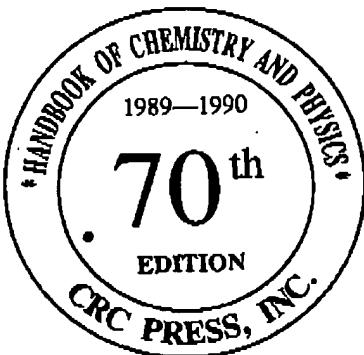
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CRC Handbook of Chemistry and Physics

A Ready-Reference Book of Chemical and Physical Data



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CRC Press, Inc.
Boca Raton, Florida

ELECTRONIC CONFIGURATION OF THE ELEMENTS

By Laurence S. Foster

References: F. H. Spedding and A. H. Daane, Editors, *The Rare Earths*, John Wiley and Sons, Inc. Publishers, New York, 1961. R. F. Gould, Editor, *Lanthanide-Actinide Chemistry, Advances in Chemistry Series, No. 71*, American Chemical Society, Washington, D.C., 1967; Paper No. 14, Mark Fred, *Electronic Structure of the Actinide Elements*.

| Atomic No. | Element | K | L | M | N | O | P | Q |
|------------|---------|-----|-------|---------|---------|---------|---------|---------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | s p | s p d | s p d f | s p d f | s p d f | s p d f | s p d f |
| 1 | H | 1 | | | | | | |
| 2 | He | 2 | | | | | | |
| 3 | Li | 2 | 1 | | | | | |
| 4 | B | 2 | 2 | | | | | |
| 5 | C | 2 | 2 | 1 | | | | |
| 6 | N | 2 | 2 | 2 | | | | |
| 7 | O | 2 | 2 | 2 | 1 | | | |
| 8 | F | 2 | 2 | 2 | 2 | | | |
| 9 | Ne | 2 | 2 | 2 | 2 | 1 | | |
| 10 | | | | | | | | |
| 11 | Na | 2 | 2 | 2 | 2 | 2 | | |
| 12 | Mg | 2 | 2 | 2 | 2 | 2 | 1 | |
| 13 | Al | 2 | 2 | 2 | 2 | 2 | 2 | |
| 14 | Si | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 15 | P | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16 | S | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | Cl | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 18 | Ar | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 19 | | | | | | | | |
| 20 | K | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 21 | Ca | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 22 | Ti | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 23 | V | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 24 | Cr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 25 | Mn | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 26 | Fe | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 27 | Co | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 28 | Ni | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 29 | Cu | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 30 | Zn | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 31 | Ga | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 32 | Ge | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 33 | As | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 34 | Se | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 35 | Br | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 36 | Kr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 37 | Rb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 38 | Sr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 39 | Y | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 40 | Zr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 41 | Nb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 42 | Mo | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 43 | Tc | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 44 | Ru | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 45 | Rh | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 46 | Pd | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 47 | Ag | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 48 | Cd | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 49 | In | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 50 | Sn | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 51 | Sb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 52 | Te | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 53 | I | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 54 | Xe | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

* Note irregularity.

| Atomic No. | Element | K | L | M | N | O | P | Q |
|------------|---------|-----|-------|---------|---------|---------|---------|---------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | s p | s p d | s p d f | s p d f | s p d f | s p d f | s p d f |
| 55 | Ca | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 56 | Sc | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 57 | Ts | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 58 | Cr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 59 | Pr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 60 | Nd | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 61 | Eu | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 62 | Tb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 63 | Dy | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 64 | Ho | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 65 | Er | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 66 | Tm | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 67 | Yb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 68 | Ts | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 69 | Lu | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 70 | Hf | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 71 | Ta | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 72 | W | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 73 | Re | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 74 | Os | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 75 | Ir | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 76 | Pt | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 77 | Au | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 78 | Hg | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 79 | Tl | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 80 | Pb | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 81 | Bi | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 82 | Po | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 83 | At | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 84 | Rn | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 85 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 86 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 87 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 88 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 89 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 90 | Ts | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 91 | Pr | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 92 | U | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 93 | Pm | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 94 | Eu | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 95 | Ts | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 96 | Y | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 97 | Lu | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 98 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 99 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 100 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 101 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 102 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 103 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 104 | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |